

# Role of Gut Brain Axis in Grahani Roga

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## ABSTRACT

The gut brain axis is the two-way biochemical signalling that takes place between the gastrointestinal tract and the central nervous system. The term gut brain axis highlights the role of gut microbiota in these biochemical signalling. Broadly defined, the Gut brain includes the central nervous system, neuroendocrine system, the hypothalamic – pituitary- adrenal axis, sympathetic and parasympathetic arms of autonomic nervous system, the enteric nervous system, vagus nerve, and the gut microbiota<sup>1</sup>. Grahani roga is the prime disease of gastro-intestinal tract and seen often in day today practice. In our classic grahani is consider as an agni adhishana. Any disturbance in the status of agni lead to grahani roga. Ayurveda described the individuality of mana and shareera and their inseparable and independent relation in formation of disease in grahani roga. Both ayurved and contemporary science accept the fact that for better management and prevention of grahani roga, psychological factors are having a significant role. So, in order to remove diseases from the root, the causative factors should be understood and ruled out completely. In this article an effort is made to understand the role of manasik bhavas in grahani roga.

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## INTRODUCTION

In ayurveda, ayu is defined as union of body, soul and senses. A very well-balanced diet and regular exercise are the important to a healthy life. In this technological era, the change in the life style, food habits, tension, suppression of urges due to busy schedule, tremendous mental stress results in various disease. All these mental and physical life style alter the function of digestion and absorption, leading to various digestive disorders.

**Grahani** is specialized part of mahastrotasa. The word grahani is derived from root of graha upadane means to hold or to get. It is situated between amashaya and pakwashaya. It is suit of agni. Grahani and agni are complimentary to each other. It is also

responsible for retention of food for sufficient time for proper digestion and assimilation of the nutrients from the digested food. Dysfunction of grahani is termed as grahani dosha<sup>2</sup>.

### Nidana of grahani roga

- Aharaja – abhojana, atibhojana, vishamabojana, asatmya bhojana, guru, atisheeta and dushita ahara sevana.
- Vyapda of vama, virechana, snehana, vyadi karshita.
- Vega vidharana.
- Virudha of desha, kala, and ritu.
- Manasika nidana – shoka, bhaya and krodha.

### Vishista nidhana acc to doshas<sup>3</sup>

SN	Vataja grahani	Pittaja grahani	Kaphaja grahani
1	Katu, tikta, Kashaya rasa ahara sevana	Katu, amla rasa yukta ahara sevana	Ati guru, Snigda, sheeta ahara sevana
2	Atiruksha, atisheeta, dooshita bhojana	Ajeerna,	Abishyandi ahara
3	Pramitashana, anashana	Ati kshara and amlyukata ahara sevan	Atibhojana
4	Vegadharana	vidhahi anna pana	Bhukta matra swapna
5	Atiadwagamana, atimaituna	--	--
6		--	--

**Purvaroop<sup>4</sup>**

SN	charaka	susruta	vagbhata
1	Trushna	Saada	Amlapaka
2	Alasya	Klama	Chardi
3	Balakshaya	Aruchi	Bhrama
4	Chirtapaka	Kasa	Praseka
5	Sharer gourava	Karna kshweda	Vaktravairasya
6	Vidhahata	Atrakujana	---

**Classification of grahani acc to different acharya**

SN	Charaka 5	Susruta	Astanga sangraha	Madhava nidhana
1	Vataja	Vataja	Vataja	Vataja
2	Pittaja	Pittaja	Pittaja	Pittaja
3	Kaphaja	Kaphaja	Kaphaja	Kaphaja
4	Sannipataja	Sannipataja	Sannipataja	Sannipataja
				Samgrahani
				Gatigrahani

**Lakshana of grahani roga<sup>3</sup>**

- Vataja grahani
  1. Flatulence after and during digestion
  2. Sarvarasa gruiddi
  3. Karnakshwada, hrutpida, trushna, kshuda
  4. Food digested with difficulty, suktapaka, visuchika.
  5. Passes stool with difficulty, liquid mixed with hard stool, undigested repeatedly.
- Pittaja grahani
  1. Foetid and sour eructation
  2. Hunger, thirst, blurred vision, tinnitus
  3. Watery stool, undigested, yellowish stool
- Kaphaja grahani
  1. Heaviness and stiffness in abdomen
  2. Nausea, vomiting, mouth salivation, sweetness in mouth,
  3. Lack of desire towards work
  4. Weakness and lassitude.
  5. Stool not well formed but broken into pieces, mixed with ama and mucous and heavy stool.
- Sannipataja grahani
  1. Mixed with lakshana of vataja, pittaja, kaphaja grahani.
- Sangrahani<sup>6</sup>
  1. Sangrahani is marked by presence of gargling sounds in the intestines, laziness, weakness and malaise. In this condition the person excretes faeces which are liquid, cold, dense and unctuous and associated with pain in the waist.
  2. The faeces which are inadequately processed is elimination in large quantities, associated with slimy material along with sounds may appear once in 15, 30 or 10 days or even daily.
  3. The symptoms are pronounced during the day time and subside by night time.
  4. This condition is caused by vata associated with ama and is called sangrahani
- Ghatyantra grahani<sup>7</sup>
  1. The person in this condition suffers from pain in the flanks while lying down and sounds resembling that produced when a pot is dipped in the water are heard from the abdomen. This condition is incurable.

**SAMPRAPTI GHATAKA**

<b>Nidhana;</b>	Aharaja, viharaja, mansika karanas
<b>Doshas;</b>	Kledaka kapha, pachaka pitta, samana vayu
<b>Dushya;</b>	Rasa
<b>Agni;</b>	Jataragni-mandhya

<b>Ama;</b>	Amavisha
<b>Srotasa:</b>	Annavaha, purishavaha, rasavaha srotasa
<b>Srotodusti:</b>	Sanga, atipravruti.
<b>Udbhavastana:</b>	Amashaya
<b>Rogamarga:</b>	Madhyama
<b>Vyadhiswabava:</b>	Chirakari
<b>Adhistana:</b>	Grahani

## ROLE OF ENTERIC NERVOUS SYSTEM

The enteric nervous system is one of the main divisions of the nervous system and consists of a mesh-like system of neurons that governs the function of the gastrointestinal system; it has been described as a "second brain" for several reasons. The enteric nervous system can operate autonomously. It normally communicates with the central nervous system (CNS) through the parasympathetic (e.g. The vagus nerve) and sympathetic (e.g. Via the prevertebral ganglia) nervous systems. However, vertebrate studies show that when the vagus nerve is severed, the enteric nervous system continues to function.<sup>[8]</sup>

In vertebrates, the enteric nervous system includes efferent neurons, afferent neurons, and interneurons, all of which make the enteric nervous system capable of carrying reflexes in the absence of CNS input. The sensory neurons report on mechanical and chemical conditions. Through intestinal muscles, the motor neurons control peristalsis and churning of intestinal contents. Other neurons control the secretion of enzymes. The enteric nervous system also makes use of more than 30 neurotransmitters, most of which are identical to the ones found in CNS, such as acetylcholine, dopamine, and serotonin. More than 90% of the body's serotonin lies in the gut, as well as about 50% of the body's dopamine; the dual function of these neurotransmitters is an active part of gut-brain research.<sup>[9][10]</sup>

The first of the gut-brain interactions was shown to be between the sight and smell of food and the release of gastric secretions, known as the cephalic phase, or cephalic response of digestion.<sup>[11][12]</sup> Chronic or acutely stressful situations activate the hypothalamic-pituitary-adrenal axis, causing changes in the gut microbiota and intestinal epithelium, and possibly having systemic effects. Additionally, the cholinergic anti-inflammatory pathway, signalling through the vagus nerve, affects the gut epithelium and microbiota. Hunger and satiety are integrated in the brain, and the presence or absence of food in the gut and types of food present also affect the composition and activity of gut microbiota.

The relationship between gut microbiota and humans is not merely commensal (a non-harmful coexistence), but rather a mutualistic relationship. Human gut microorganisms benefit the host by collecting the energy from the fermentation of undigested carbohydrates and the subsequent absorption of short-chain fatty acids (SCFAs), acetate, butyrate, and propionate. Intestinal bacteria also play a role in synthesizing vitamin B and vitamin K as well as metabolizing bile acids, sterols, and xenobiotics. The systemic importance of the SCFAs and other compounds they produce are like hormones and the gut flora itself appears to function like an endocrine organ; dysregulation of the gut flora has been correlated with a host of inflammatory and autoimmune conditions.

## FUNCTIONS OF NEUROTRANSMITTER

SN	neurotransmitter	Released by	Function
1	GABA	Central nervous system	Relaxes lower oesophageal sphincter.
2	Norepinephrine	CNS, spinal cord, sympathetic nerves	Decreases motility, increased contraction of sphincters, inhibits secretions.
3	Acetylcholine	CNS, autonomic system, other issues	Increase motility, relaxes sphincters, stimulates secretion.
4	Serotonin	GI tract, spinal cord	Facilitates secretion and peristalsis.

## DISCUSSION

The mind is key factor in all forms of intestinal bowel syndrome. Body and mind are interconnected. One can affect the other because one is Adhara and the other is Adheya. Therefore, it is evident that psychological factors support somatic illnesses. Even while each Manasika Bhava (psychological element) plays a unique part in every ailment, according to

classical Ayurvedic theory, certain of them have been shown to play a significant impact in Grahani Roga. Even healthy food consumed in the right quantity does not get digested by samagni person, according to Acharya Charaka, if that person is also experiencing Chinta, Krodha, Bhaya, Shoka, and Dukh-Shayya Prajagare.

In grahani doshas are involved in formation of disease are kledaka kapha, pachaka pitta, samana vata. The samana vata play important role in maintaining prakruta karma of grahani and also if vitiation to that may produce disease like grahani roga. Samana vata is situated near to agni, Function of Samana vata are anna dharana (which holds the undigested food), Pachana (digestion of food), Vivechana (segregation of sara and kitta бага of ahara), Munchayati (which helps in pushing kitta bhaga of ahara to next parta). Vitiation of samana vata exhibits symptoms like disturbance in digestion, apakwa malapravrutti, admana, atisara, etc.

Serotonin is one of neurotransmitter which is found in cells of GI tract, released into blood circulation and absorbed by platelets. Only 10% is produced by brain and remaining in 90% released by GI tract. Serotonin is chemical it plays a role in mood swing, sleep, nausea, digestion of food. Variation in serotonin causes different disease of GI tract. (Ex: increased serotonin – increases bowl movement, decreased serotonin – reduces intestinal motility). Function of samana vata similar to that of function of serotine in relation to grahani.

### Conclusion

Ayurveda is a branch of medicine that primarily focuses on two areas of disease analysis, understanding, and treating manasika and sharirika doshas. Grahani roga needs both manasika and sharirika chikitsa. In Modern science also recent research aiming to understand the influence of gut microbiota on bidirectional interactions between the gut and brain. The abdomen is the sounding board of the emotion reflecting emotional disorders more than any other system. According to Madhava nidhana he has mention psychological factors which add on causes for formation of grahani roga. In Modern science IBS (irritable bowel syndrome) may mimic symptoms similar to grahani. in contemporary medicine mentioned that psychological factors which may effects on gastrointestinal system produce IBS disease.

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